COMMAND & CONTROL AS AN OPERATIONAL FUNCTION OF INFORMATION WARFARE

PRESENTED BY:

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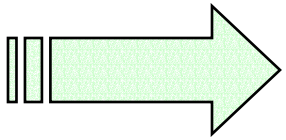
Agenda



- Introduction / Background
- The IW Vision
- Considerations
- Functional Relationships
- IW Architecture
- Summary
- Future Initiatives

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History

*"**Industrialization** led to attritional warfare by massive armies. **Mechanization** led to maneuver predominated by tanks. **The information revolution** implies the rise of cyberwar, in which neither mass nor mobility will decide outcomes; instead, the side that knows more, that can disperse the fog of war yet enshroud an adversary in it, will enjoy decisive advantages."*

--John Arquilla and David Ronfelt, RAND

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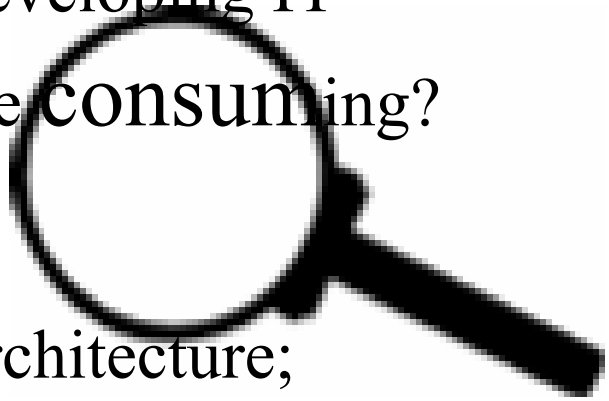
Think About This First…

- Considering all that has been done over the past ten years or so …
  - Why is the process of identifying and developing IT architectures so difficult, costly and time consuming?
  - Why are we still struggling to:
    - **define** what exactly constitutes an architecture;
    - **identify** what type of architectures do and/or should exist;
    - **categorize** architecture concepts; and,
    - **develop** a long range plan for architecture development and maintenance?



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A Decade+ of Events

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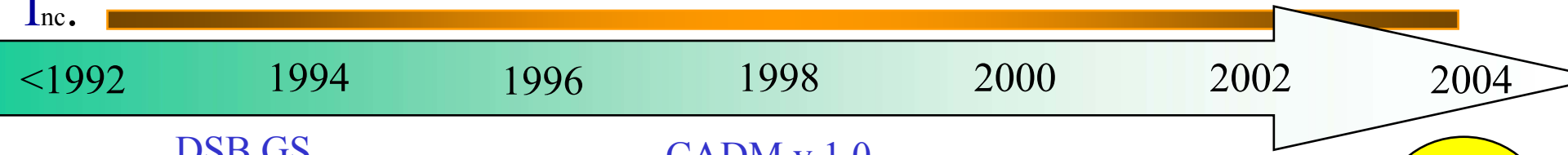

DSB GS
OPNAV 9410.6

esert Shield
esert Storm
oDD 8320.1

DSB R
DoD Enterprise Model
USAF SAB Info Arch
DoD 8320.1-M

CADM v 1.0
CAF v 2.0
OMB M-97-16
JCS 3-13
DoD JTA v 2.0

W N ?

Iraqi Freedom

DoDD 4630.5
DoDD 4630.8
DoDD TS3600.1
Croesus Strategies

DoD Arch Rev (IPSG)
CISA Established
CJCSI 6212.01A
JP 6-0 / 6-02

NDIA Interoperability
GAO/NSIAD-98-73
PDD 62 / 63

NDIA IA Study
JTA v 3.0 (Draft)
Bosnia
DoN ITI Arch (Draft)

ITMRA
CJCSI 3210.01
CJCSI 6510.01A
PEO 13010
DoD JTA v 1.0
GAO/AIMD 96-110

AFCEA Spring
Intelligence
Symposium

9/11/01

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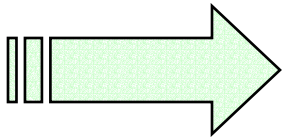

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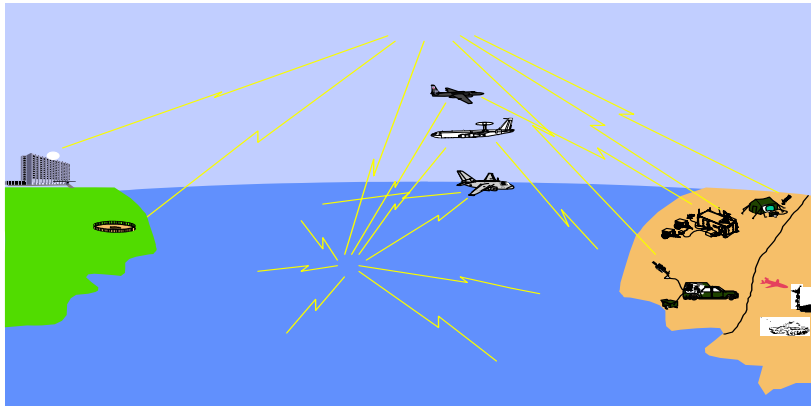
IW Vision

Information Superiority through the availability and use of the right information, at the right place, at the right time, to all decision makers, while denying that information to the enemy.



At the conceptual level:

"IW consists of all efforts to control, exploit, or deny an adversary's capability to collect, process, store, display, and distribute information, while at the same time preventing the enemy from doing the same." [Garigue, 1995]

Within the Department of Defense (DoD) IW is a fully integrated, embedded, joint, interoperable core set of functional modules building upon the infrastructure and technical capabilities of existing systems augmented as necessary with new / enhanced functionality provided by advanced technologies that fully satisfy validated operational requirements providing a forward deployed, Joint IO capability.

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In Theory …

ohn Frederick Charles Fuller (1876-1966)

"Our present theory is to destroy personnel, our new theory should be to destroy command. Not after the enemy's personnel has been disorganized, but before it has been attacked, so that it may be found in a state of disorganization when attacked."

-Extracted from J.F.C. Fuller, Memorandum
"Strategic Paralysis as the Object of the Decisive Attack"
May 1918

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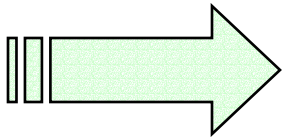

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Organizational Considerations

"Information Warfare is a national, strategic concern. Our economy, national life and military capabilities are very dependent upon information - information often vulnerable to exploitation or disruption."

[DSBIAB, 1994]

The Defense Science Board (DSB) twice commented that DoD needs a highly placed C4I Architect and "... *a coordinated DoD approach with standardized guidelines that would be applicable to all Services*."

[DSBGS, 1993] and [DSBR, 1994]

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Operational Considerations

- Terminology – IW/IO/C2W, ???
- IW, the segment of IO dealing with conflict, provides enhanced capability in the areas of mission planning and preparation, C4I support, analysis, information security and attack.
- As defined by the Roles and Missions Commission IW includes, "*Offensive and defensive measures aimed at controlling, disrupting, or destroying an adversary's information flow while protecting one' own*." [RMC, 1995]

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Information Considerations

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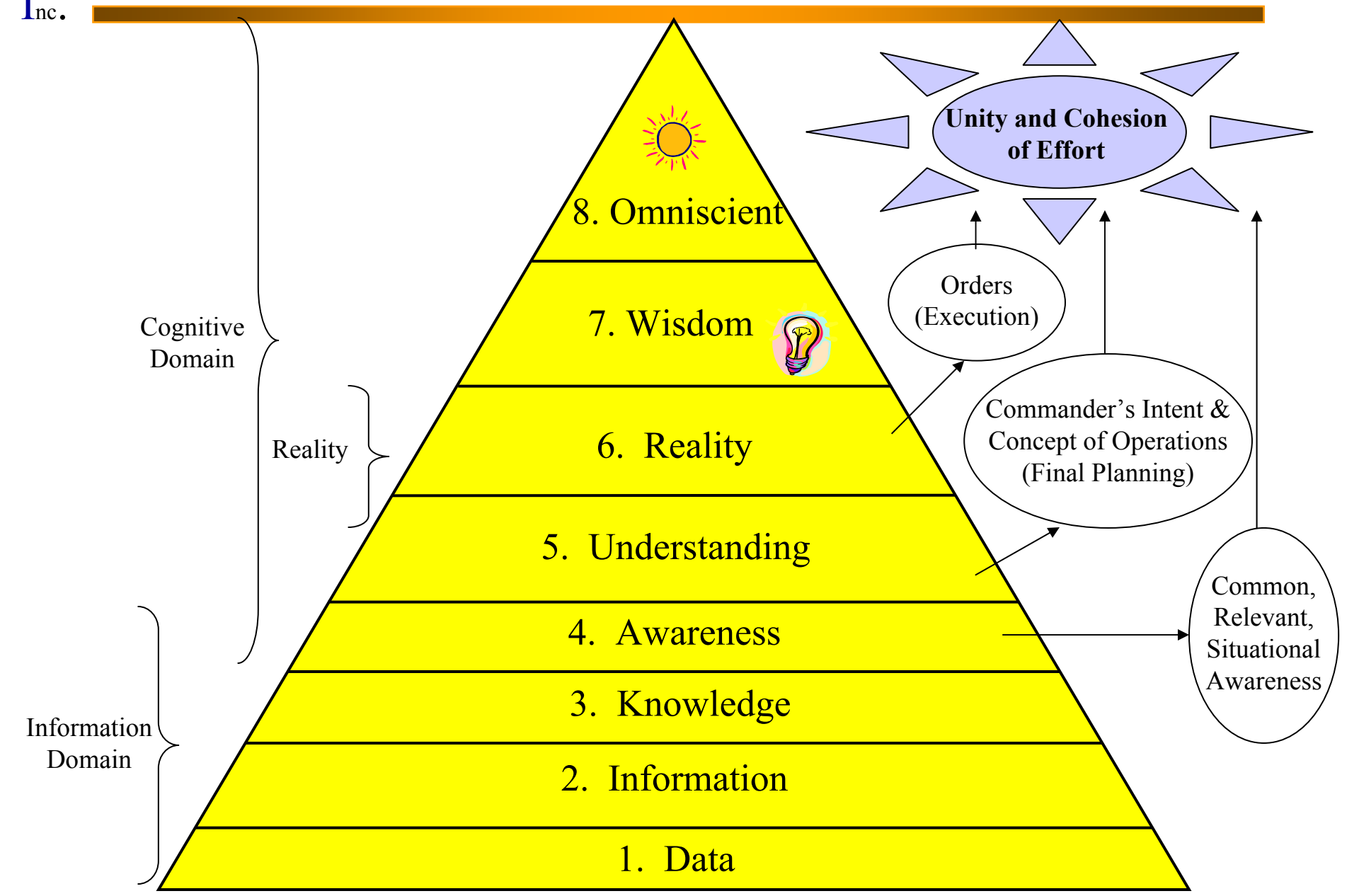

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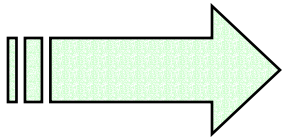

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Mahan

Alfred Thayer Mahan (1840-1914)

"Communications dominate war; they are the most important single element in strategy."

Mahan (1907)

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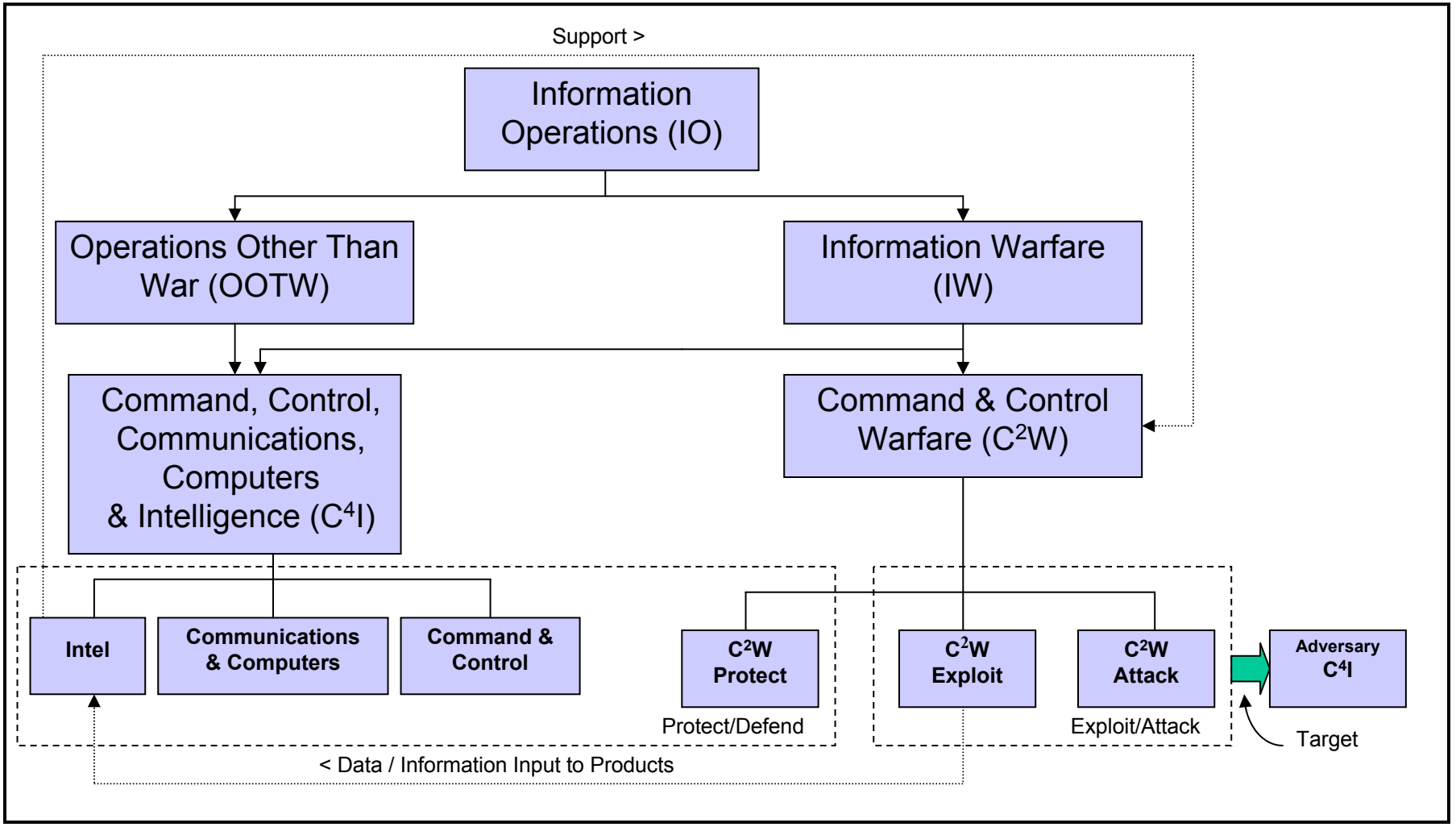
Functional Relationships



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Hutcherson

- *"Information-based Warfare is an approach to armed conflict focusing on **the management and use of information** in all its forms and at all levels to achieve a decisive military advantage especially in the joint and combined environment.*
- *Information-based Warfare is both **offensive and defensive** in nature—ranging from measures that prohibit the enemy from exploiting information to corresponding measures to assure the integrity, availability, and interoperability of friendly information assets.*
- *While ultimately military in nature, Information-based Warfare is also waged in political, economic, and social arenas and is **applicable over the entire national security continuum** from peace to war and from 'tooth to tail.'*
- *Finally, Information-based Warfare focuses on the **command and control needs** of the commander by employing state-of-the-art information technology such as synthetic environments to dominate the battlefield."*

Hutcherson (1994)

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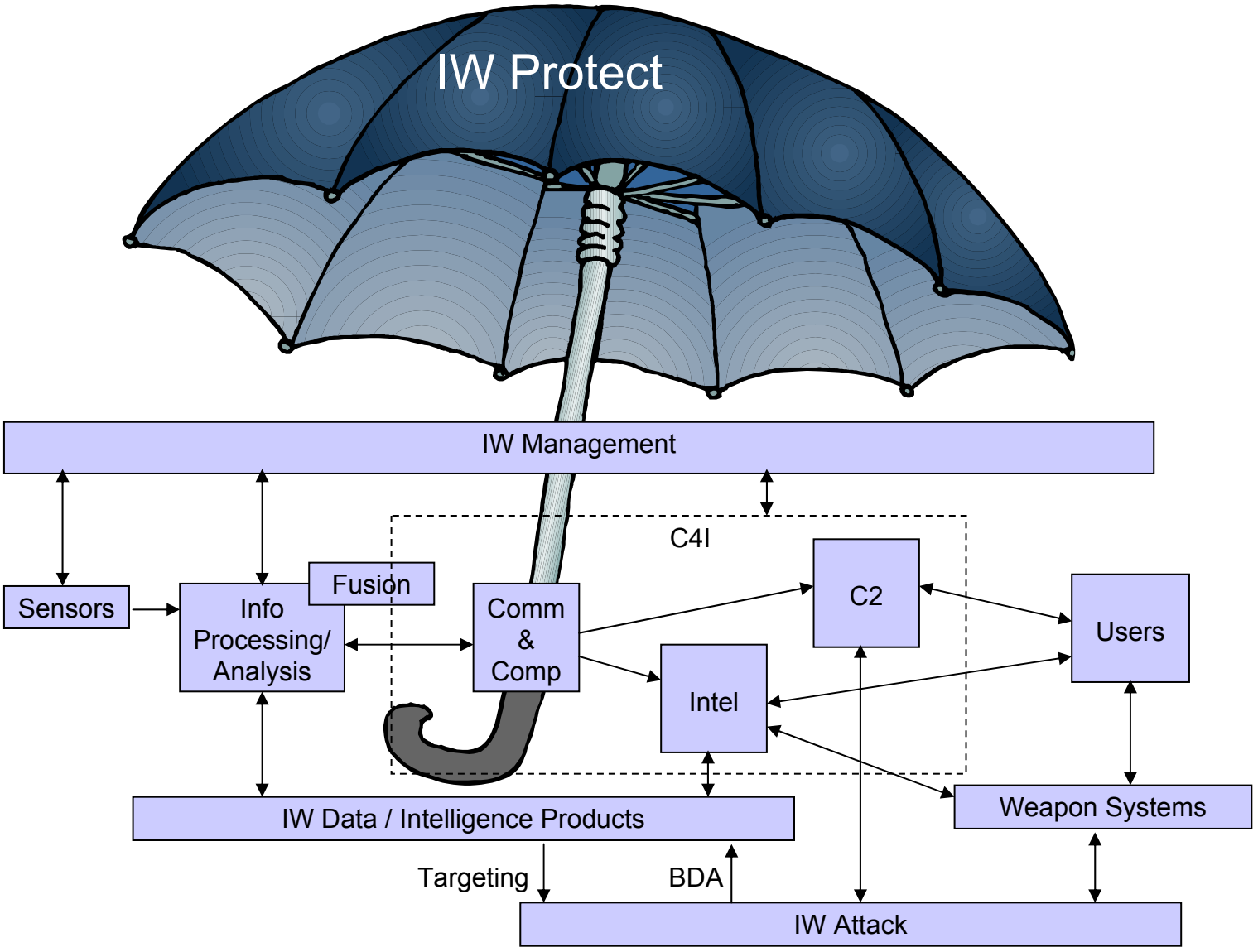

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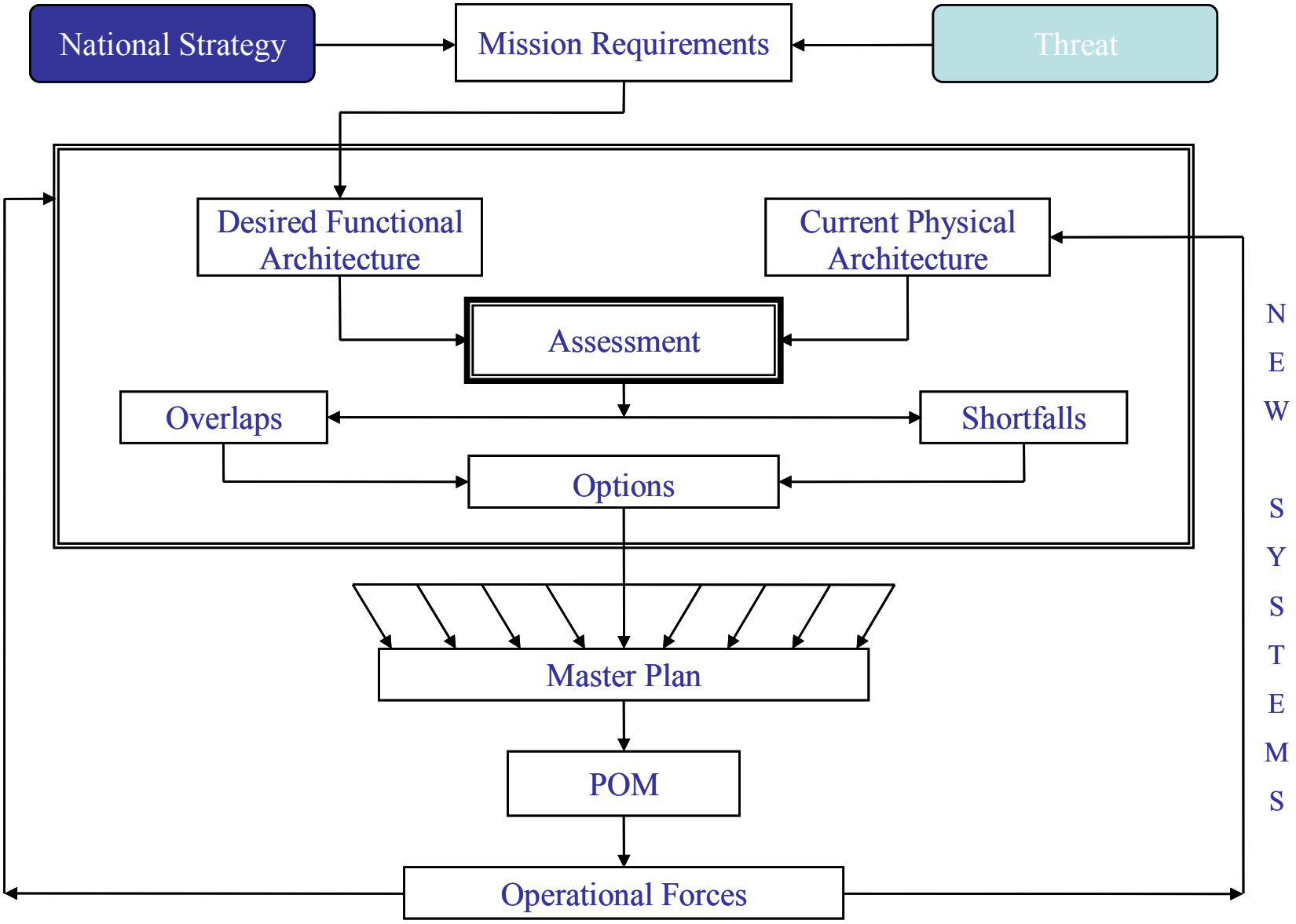
Architecture Process



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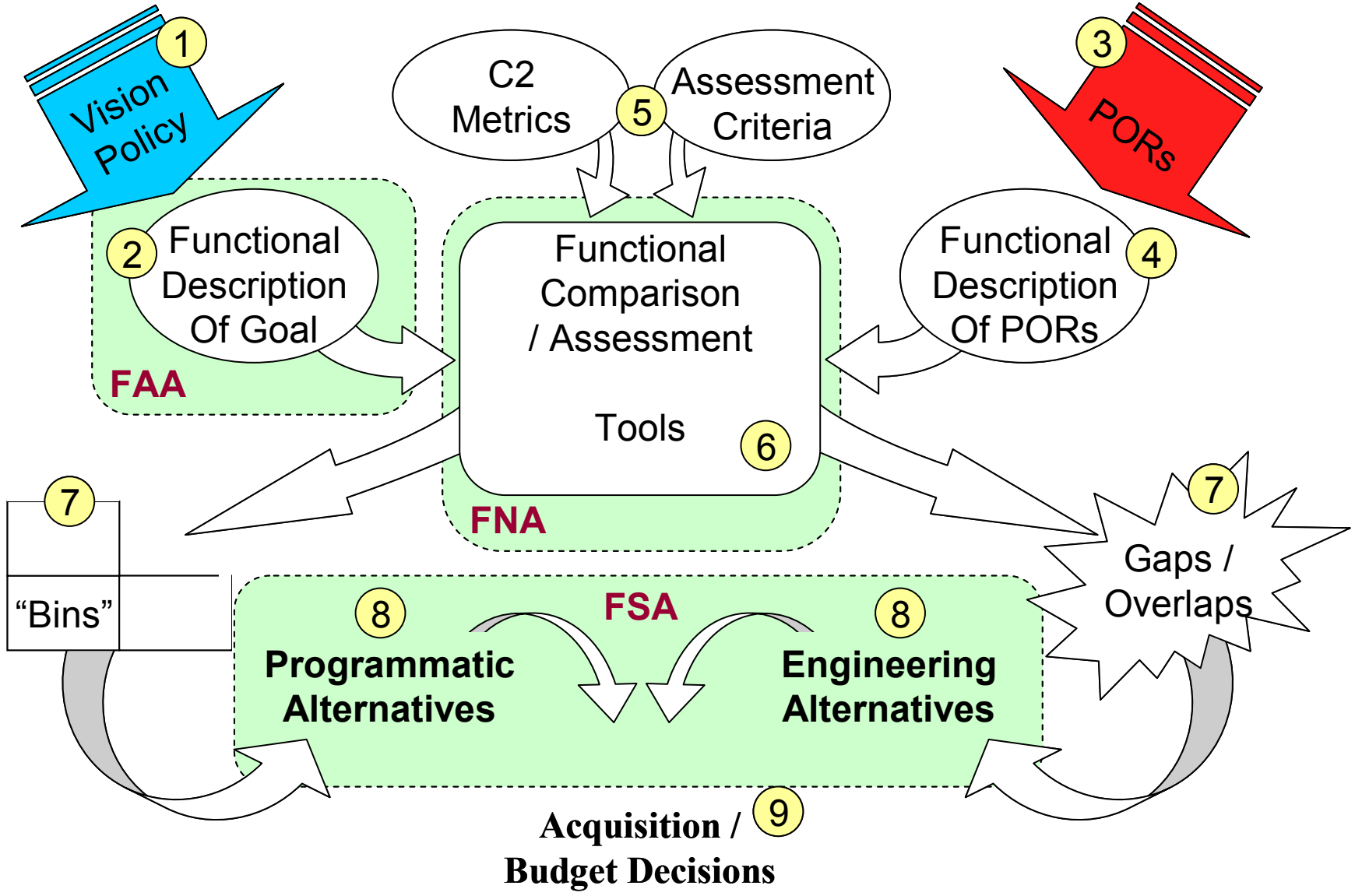
Assessment Process



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The 8 Goals for Data Management

Data must be managed such that it can exist in a system that will:

1. expand the bandwidth by 100 to 1000 times for multimedia information delivery;
2. provide smart push and warrior pull via an information grid;

3. provide information management technology to augment the various services and tactical networks to include:
   - data transport services (error recovery, levels of service, instrumentation, and diagnostics),
   - information security, integrated database query and retrieval (repository mediation, information brokering, filtering, profiling, storage management, and data linking), and
   - tools for commanders to enforce an information policy;

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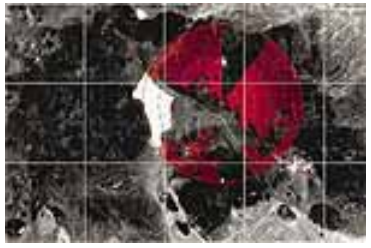
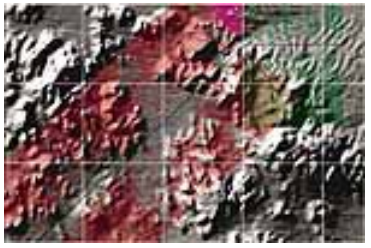
The 8 Goals for Data Management (cont.)

4. use the data accessed via the IDS to create a graphical depiction of the current situation which is consistent across Services and up and down echelon;
5. allow the user to tailor his view of the battlespace;
6. provide the necessary hardware and software for warfighter workstations to allow them to receive, request, store, manipulate, and view integrated information;





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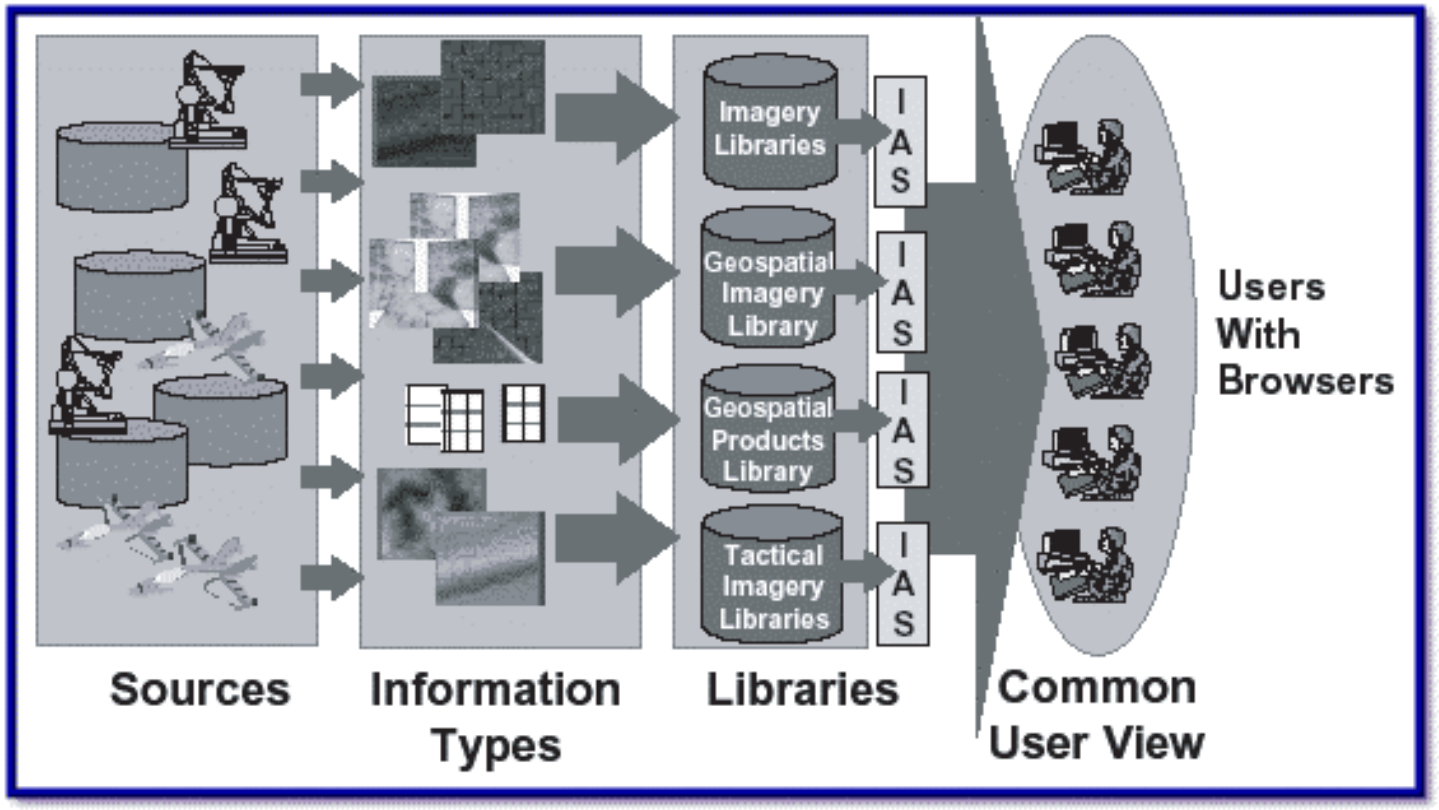
The 8 Goals for Data Management (cont.)

7. provide a capability which minimizes life cycle cost; and
8. deliver a system which contains the safeguards necessary to operate in an active information warfare environment.



Courtesy Peter Winter, Harris Corporation

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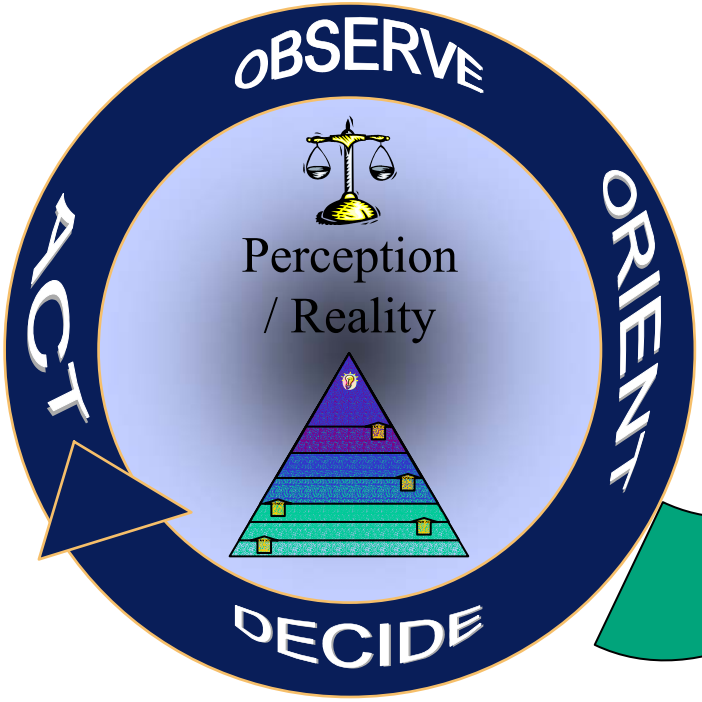
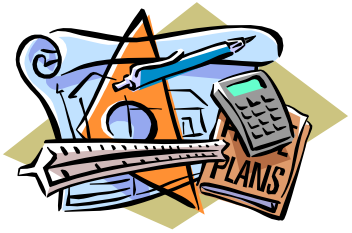
So …

Interoperable Systems

Timely Decisions





A Single Architecture

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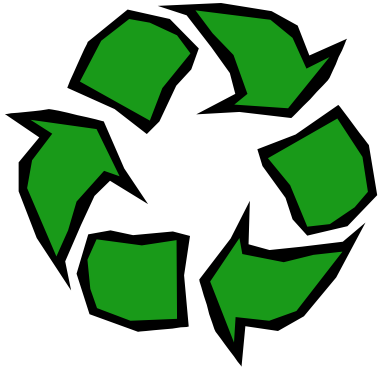
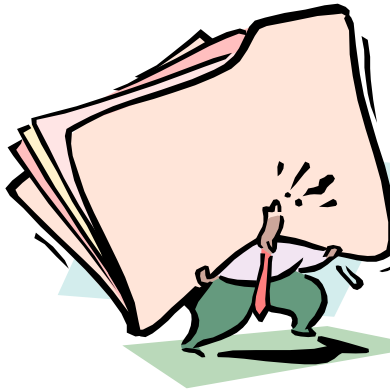
IA, Interoperability & Architecture

A Well Designed Architecture



Connected Interoperable Systems

Distributed Information



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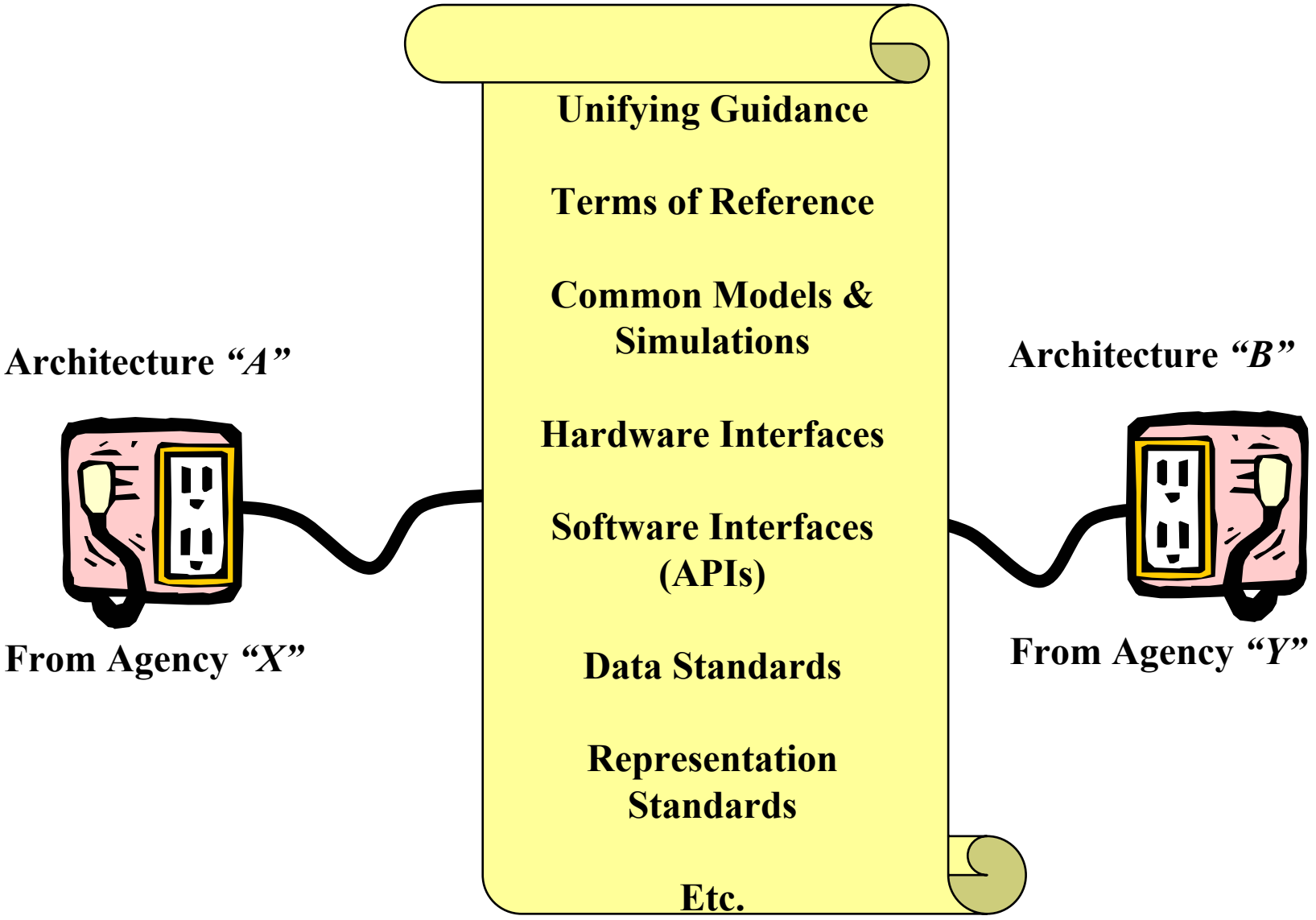
Standards



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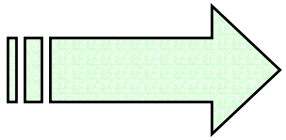

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Summary

- ✓ **Data -** the competition for information is as old as the first conflict. It involves increasing and protecting our own store of information while limiting and penetrating the adversary's. As it pertains to C2 as an operational function of information warfare - targeting the enemy's information functions, while protecting ours, with the intent of degrading his will or capability to fight.
- ✓ **Management** – e.g., advanced battlefield management (e.g., using information and information systems to provide information on which to base military decisions when prosecuting a war); and Risk Management – for the risks potentially associated with information and information technology (IT) to be identified and managed cost-effectively, it is essential that the process of analyzing and assessing risk is well understood by all parties and executed on a timely basis.
- ✓ **Process** - Information Warfare processes are making dramatic changes in how we fight wars. The process must allow a commander's vision and view of the battlespace to be shared at the lowest possible level. From the unique perspectives of soldiers, sailors, marines and airmen, the process must forge a common understanding of how to use information warfare to enhance joint C2 warfighting capabilities. The Global Information Grid (GIG) is an example of such a process.

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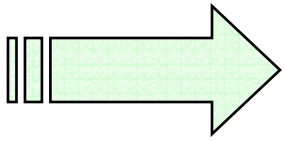

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Future Work

1. How can we enable all appropriate C2 decision makers to successfully achieve information dominance?
2. How can IW opportunities and risks be considered in the design, acquisition, accreditation, and employment of information-based systems for the DoD?
3. How can a common tactical picture be readily available to those who need it which, at one level or another, is virtually everyone?

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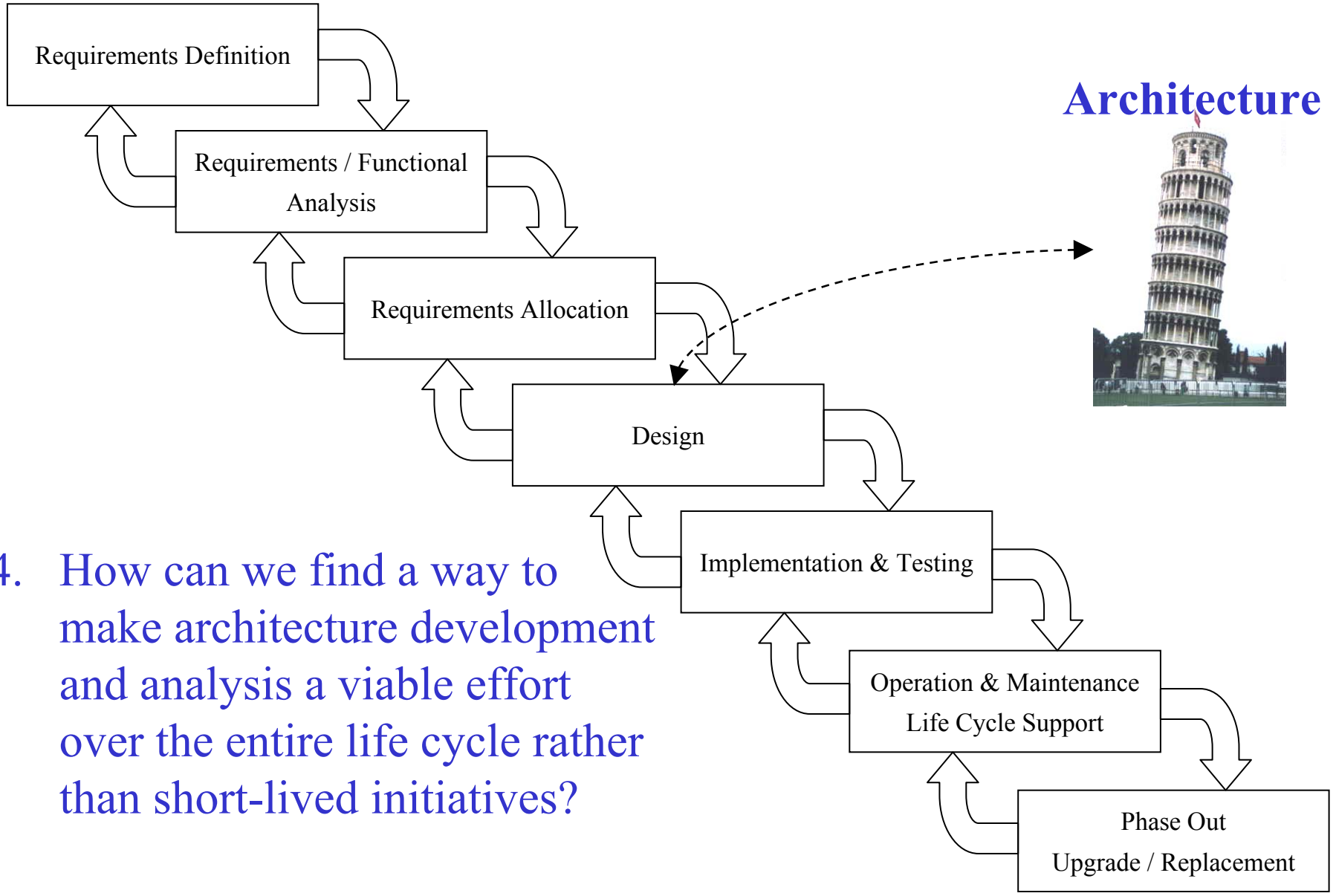
Future CCRTS Work (Cont.)



4. How can we find a way to make architecture development and analysis a viable effort over the entire life cycle rather than short-lived initiatives?

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THE PLAN ?

Publius Syrus (42 B.C.)

It is a bad plan that admits of no modification.

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